What is claimed is:

1. A method for inspecting a phase shift mask that is used with an optical exposure system under a set of exposure conditions, said method comprising:

acquiring a plurality of aerial images of said phase shift mask using a transmitted light, said plurality of aerial images being acquired within a process window of said exposure system and using said set of exposure conditions; said plurality of aerial images including a first and a second aerial image of a phase shift mask; wherein said first aerial image of said phase shift mask is in a first out of focus condition, and said second aerial image of said phase shift mask is in a second out of focus condition; and

comparing said first and said second aerial images to detect phase defects and errors in said phase shift mask.

2. The method of claim 1, wherein said first out of focus condition is a positive out of focus condition, and said second out of focus condition is a negative out of focus condition.

3. The method of claim 1, wherein prior to said comparison step, said first and second aerial images are transformed to simulate a behavior of an exposure system and photoresist.

4. The method of claim 1, wherein said acquired aerial images of said phase shift mask are magnified in relation to corresponding images created on photoresist by said optical exposure system using said phase shift mask.

5. The method of claim 1, further comprising automatically processing results of said comparison.

6. The method of claim 1, further comprising using results of said comparison to produce a map of said variations in said phase of said phase shift mask.

7. The method of claim 1, wherein said transmitted light is provided using a pulsating light source.

8. The method of claim 7, wherein said pulsating light source is a pulsating laser.

9. The method of claim 1, wherein said acquiring said plurality of aerial images comprises providing continuous relative movement between said transmitted light and said phase shift mask.

10. The method of claim 7, wherein said acquiring said plurality of aerial images comprises providing continuous relative movement between said laser and said phase shift mask.

11. An apparatus for inspecting a phase shift mask that is used with an optical exposure system under a set of exposure conditions, said apparatus comprising:

a scanner for acquiring a plurality of aerial images of said phase shift mask under said set of exposure conditions; said plurality of aerial images of said phase shift mask comprising a first and a second aerial image of said phase shift mask; wherein said first aerial image of said phase shift mask is in a first out of focus condition, and said second aerial image of said phase shift mask is in a second out of focus condition; and

an image processing module for detecting variations in phase of said phase shift mask using said first and said second aerial images of said phase shift mask.

12. The apparatus according to claim 11, wherein said first out of focus condition is a positive out of focus condition, and said second out of focus condition is a negative out of focus condition.

13. The apparatus according to claim 11, wherein said scanner comprises a plurality of cameras for acquiring said plurality of aerial images of said phase shift mask.

14. The apparatus according to claim 13, wherein said plurality of cameras comprises:

a first camera for acquiring said first image of said phase shift mask; and

a second camera for acquiring said second image of said phase shift mask.

15. The apparatus according to claim 14, wherein:

said first camera is out of focus in a positive direction; and

said second camera is out of focus in a negative direction.

16. The apparatus according to claim 13, wherein:

said scanner further comprises a light source for illuminating said phase shift mask with an illuminating light; and

said plurality of cameras are sensitive to said illuminating light.

17. The apparatus according to claim 16, wherein said light source is a pulsating light source.

18. The apparatus according to claim 17, wherein said pulsating light source is a pulsating laser.

19. The apparatus according to claim 11, further comprising a means for effecting continuous relative movement between said scanner and said phase shift mask.

20. The apparatus according to claim 17, further comprising a means for effecting continuous relative movement between said laser and said phase shift mask.

21. The apparatus according to claim 14, wherein said scanner further comprises:

a transmission light illumination system for illuminating said phase shift mask;

an optical system for collecting light emerging from said phase shift mask and creating aerial images of said phase shift mask in said first and said second cameras.

22. The apparatus according to claim 21, wherein said optical system of said scanner further comprises a numerical aperture diaphragm for reproducing said set of exposure conditions.

23. An apparatus for inspecting a phase shift mask that is used with an optical exposure system under a set of exposure conditions, said apparatus comprising:

a light source;

transmission light illumination means for illuminating said phase shift mask;

optical means for producing a plurality of magnified aerial images of said phase shift mask under said set of exposure conditions, said optical means having a numerical aperture diaphragm for reproducing said set of exposure conditions;

imaging means for acquiring said plurality of magnified aerial images of said phase shift mask; said plurality of aerial images of said phase shift mask comprising a

first and a second aerial image of said phase shift mask; wherein said first aerial image of said phase shift mask is in a first out of focus condition, and said second aerial image of said phase shift mask is in a second out of focus condition; and

image processing means for analyzing a condition of said phase shift mask using said plurality of aerial images of said phase shift mask.

24. The apparatus according to claim 23, wherein said first out of focus condition is a positive out of focus condition, and said second out of focus condition is a negative out of focus condition.

25. The apparatus according to claim 23, wherein said light source is a pulsating light source.

26. The apparatus according to claim 25, wherein said pulsating light source is a pulsating laser.

27. The apparatus according to claim 23, further comprising a means for effecting continuous relative movement between said scanner and said phase shift mask.

28. The apparatus according to claim 26, further comprising a means for effecting continuous relative movement between said laser and said phase shift mask.

29. The apparatus according to claim 23, wherein said imaging means further comprises a plurality of cameras for acquiring said plurality of magnified aerial images of said phase shift mask when the phase shift mask is illuminated by said transmission light illumination means.

30. The apparatus according to claim 29, wherein said plurality of cameras comprises:

a first camera for acquiring said first image of said phase shift mask;

a second camera for acquiring said second image of said phase shift mask; and

said first and said second aerial images of said phase shift mask being respectively acquired by said first and said second cameras when the phase shift mask is illuminated by said transmission light illumination means.

31. The apparatus according to claim 30, wherein:

said first camera is out of focus in a positive direction; and

said second camera is out of focus in a negative direction.

32. The apparatus according to claim 23, further comprising a post process and review means for displaying said condition of said phase shift mask in a graphical form.

33. The apparatus according to claim 30, wherein:

a wavelength of the light source is identical to the wavelength of the exposure system; and

said first and said second cameras are sensitive to said spectrum of said laser light source.

34. The apparatus according to claim 23 further comprising a homogenizer disposed in the vicinity of said transmission light illumination means for reducing speckle resulting from use of said light source.